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Measurement of the Sydney and Melbourne Plates of the Astro-photographic Catalogue. Joint Report for Sydney and Melbourne.

The measuring instrument made by Repsold & Söhne on the plan of Sir David Gill, which, as was announced in the joint report of last year, reached the Melbourne Observatory in January 1900, has been constantly employed in the systematic measurement of the catalogue plates since last March.

The verdict on this instrument, as far back as last April, was that "In point of construction and workmanship it fully bears out the reputation of the makers, and experience so far gained in Melbourne in working with it confirms the reality of all the advantages and capabilities ascribed to it by Dr. Gill."

All the adjustments were made with very little trouble within the degree of accuracy and in the manner described by Sir David Gill in *Monthly Notices*, vol. xlix. page 61 *et seq.*, and remained very constant.

This instrument is far easier, far less fatiguing, and far more satisfactory to work with than any other instrument previously used here for the measurement of plates. The rate of measuring has increased considerably with experience. At present about 170 stars can be measured in one hour, and, on an average, a plate containing 400 stars is measured in the direct and reverse position by two observers, each recording for the other in alternate periods of one hour, in one working day (about 6½ hours), including the revision of measures differing by 0″·6 or more, in the reverse and direct position, which discrepancy measures amount, at most, to 3 per cent.

The rate of measuring with the Melbourne micrometers is only one-third of that obtainable with the Repsold instrument.

Owing to this fact, and to unavoidable delay in pushing forward the measuring machine which is being made at the Sydney Observatory, we ordered last May another instrument from the Repsolds similar to the first, which we hope will reach Melbourne in a few months.

Thirty-six Sydney plates and fifty-one Melbourne plates have been completely measured, containing 49,697 stars.

The average number of stars on a single plate is, approximately, 1,000 for Sydney plates, and under 300 for the Melbourne plates.

As soon as the measuring bureau, which consists of six young ladies, is fully equipped with three quick-measuring instruments it is estimated, from the present rate at which the work is proceeding, that the work of the bureau for a year consisting of about 250 full working days will be probably represented by the measures of coordinates in direct and reverse position of some 300,000 stars.

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Perth Observatory, Western Australia.

Once more, and it is hoped for the last time, the work of this observatory has been almost exclusively meteorological.

Some very useful work has, however, been accomplished, and the way made ready for the commencement of astronomical observations. In particular a book on the climate of Western Australia has been prepared. This has necessitated a thorough inspection of all records which were taken prior to the establishment of the observatory, checking all the additions, &c., and entering the results in ledgers. Its preparation has taken three or four years, as most of the officers' time was required for the routine work, but it is at last ready for the printer.

The routine meteorological work of course includes the issue of forecasts, which have been again very successful, even the public appearing to have some faith in them. The following were prepared during 1900 :—

1. For the whole State, issued at noon daily in connection with a weather map of the whole of Australia.

2. For the whole State, communicated to the Press daily at 8 P.M., in conjunction with a weather report from sixteen selected stations.

3. For the goldfields districts, telegraphed each evening at 8 P.M. to five daily newspapers circulated in that region.

4. For Perth and its immediate neighbourhood only, issued at 9 A.M. and exhibited in a pictorial form, similar to that of the London *Daily Graphic.*

The following were the percentage results for 1900 :—

	1	2	3
Correct	90	93	87
Partially correct	9	5	11
Wrong	1	2	2

The results of No. 4 were not tabulated, but the forecasts were almost invariably correct.

In astronomy the transit circle was used mainly for time purposes. Messrs. Joscelyne and Curlewis each made a determination of latitude from morning and evening circumpolars on three winter nights. Their results were respectively

$$31^\circ\ 57'\ 09''{\cdot}42 \quad \text{and} \quad 31^\circ\ 57'\ 09''{\cdot}60,$$

which are in satisfactory accordance with one another and with the value already obtained by the Government astronomer, viz. $31^\circ\ 57'\ 09''{\cdot}63$. None of these results have been corrected for errors of division.

The astrographic equatorial has been used almost entirely for the benefit of visitors. It was inevitable that many people

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